Virginia Statewide Multimodal Freight Study
I-81 Truck-Rail Diversion Update

Presented to the

Rail Advisory Board

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Overview

- Virginia Legislature mandated a study to determine the required conditions to divert the maximum amount feasible of long-haul through truck traffic in the I-81 Corridor to rail
- Cooperative effort between the Commonwealth and NS
- Subtask of the Virginia Statewide Multimodal Freight Study
- Expected to be completed Spring 2008

Overview

Scope and status

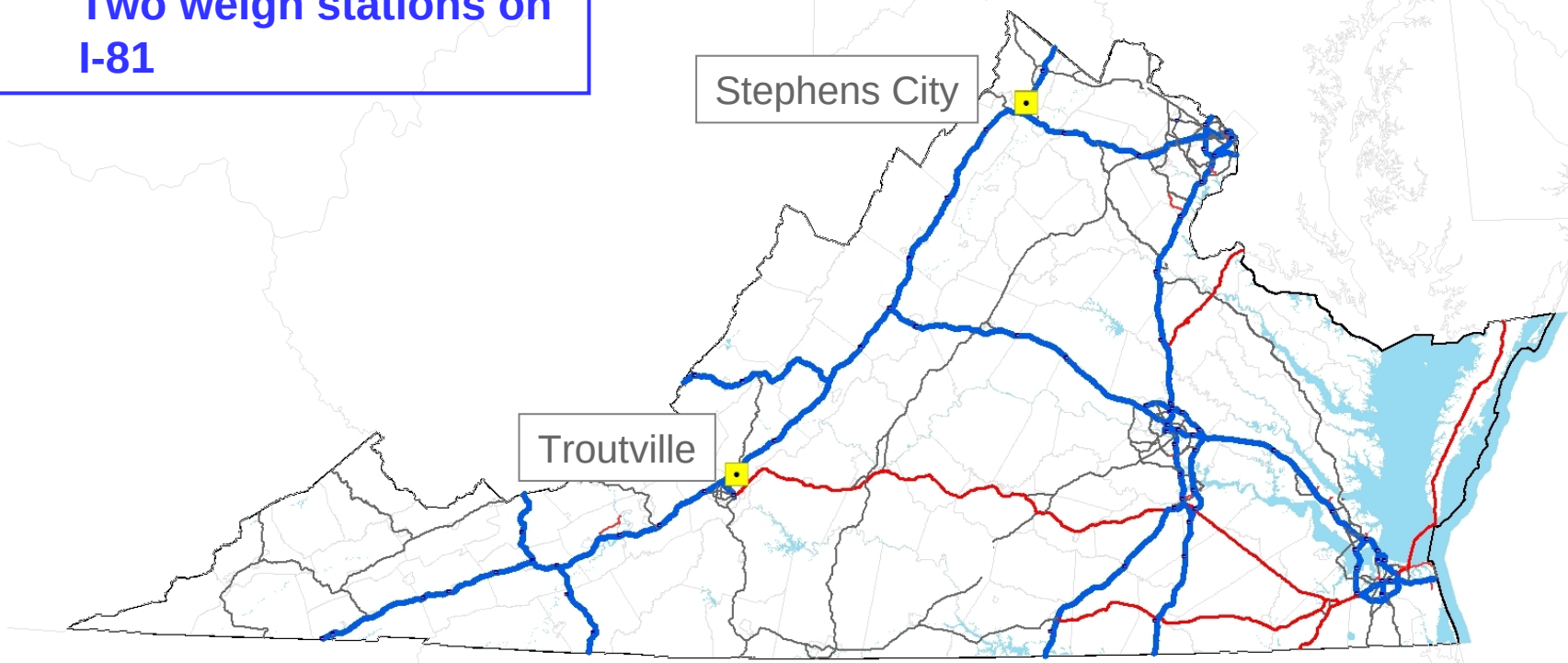
- CS has reviewed past studies and analytical tools, developed estimates of truck diversion targets to satisfy legislative intent, helped Commonwealth implement an I-81 truck survey to validate through-truck estimates
- NS to provide internal market estimates, capital needs, operations data, business metrics -- awaiting this input, some may be confidential
- CS to review NS inputs, estimate public benefits, make summary assessment, identify further analysis needs, with Commonwealth staff and Virginia DRPT consultants

Origin Destination Study

- Diversion analysis heavily dependent on Transearch data
  - Truck volumes significantly differ from ground counts and official forecasts
  - Estimated with extensive modeling using least travel time estimates
  - Lacking waste and construction traffic data
  - Does not include enough intelligence from shipper distribution patterns
- Obtain origin-destination information for all truck types at the weigh stations
  - Estimate the percentage and number of trucks using I-81 as a through-state travel route
- Obtain commodity information

Interstate 81 Weigh Stations

24-hour truck survey
June 19-20, 2007
Two weigh stations on I-81



Survey Questions

Are you empty or carrying a load?

What are you carrying?

In which city and state did you start your trip?

What route were you on when you entered Virginia, and in what direction?

In which city and state will you end your trip?

What route will you take to leave Virginia, and in what direction?

Also:

- **Are you a PrePass User?**
- **Vehicle type? (FHWA Classes 5 – 13)**
- **Trailer type? (Container, Dryvan, Liquid bulk, dry bulk, auto carrier, flat trailer, other)**

Results

10.6% capture rate (lost some to quality issues)

Origin and Destination data good with cleaning

Traffic: Continuous Counts; Class 5 - 13

- **Troutville truck count– 7,779 (NB) // 6,970 (SB)**
- **Stephens City truck count – 8,667 (NB) // 7,960 (SB)**

Commodity information

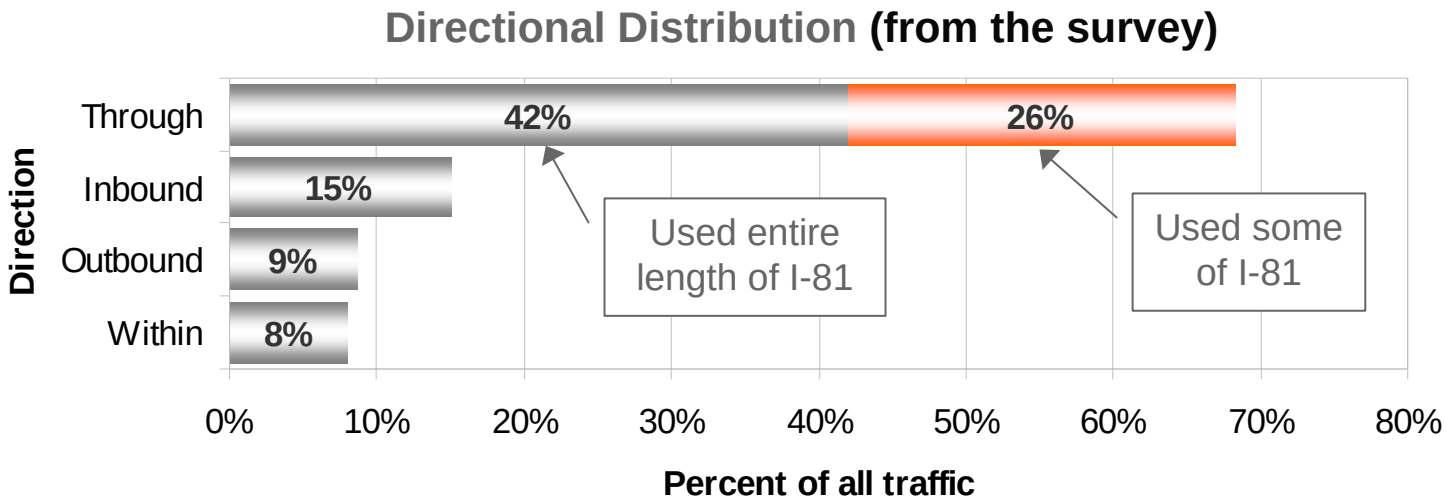
- **88 refusals (out of 3,322 surveys)**
- **27% were listed as “General” including refusals**

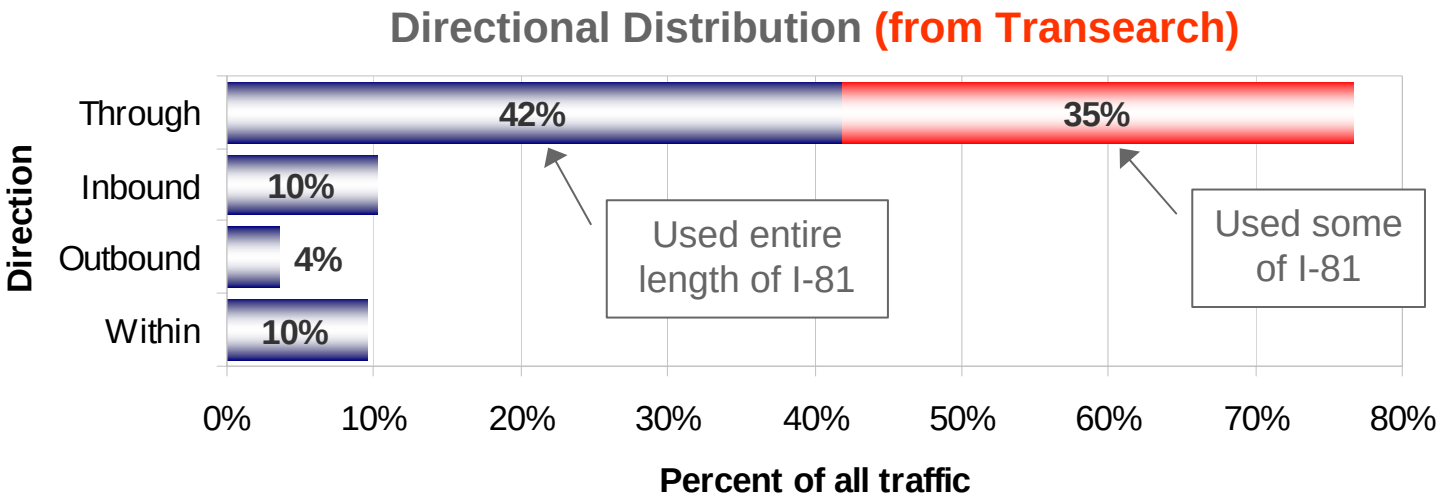
PrePass representation was 35% of those surveyed

HAZMAT trucks were 5.8% of those surveyed

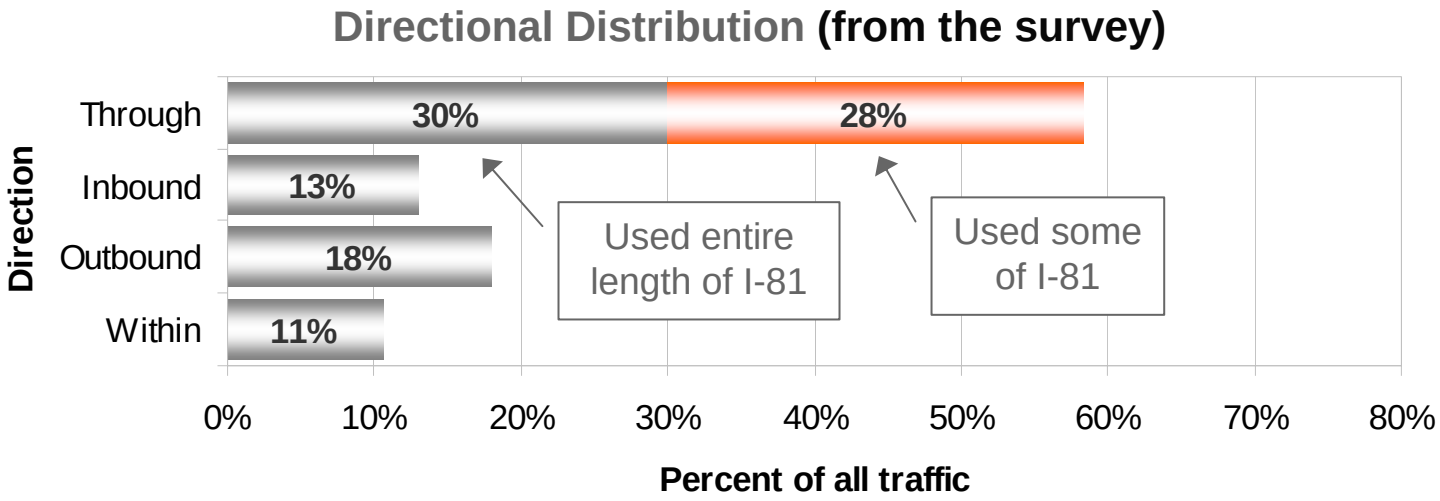
10% of Class 9 Trucks on corridor were surveyed

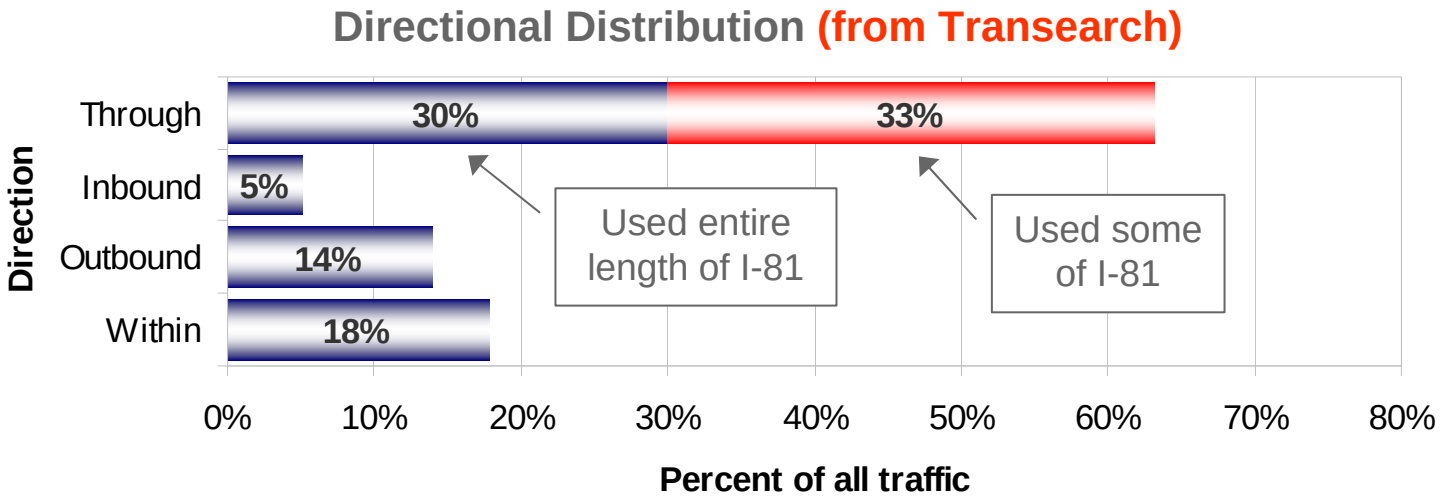
Results


Directional Distribution (from the survey)
Direction
Through
Inbound
Outbound
Within
42%
26%
15%
9%
8%
Used entire length of I-81
Used some of I-81
0%
10%
20%
30%
40%
50%
60%
70%
80%
Percent of all traffic


Directional Distribution (from Transearch)
Direction
Through
Inbound
Outbound
Within
42%
35%
10%
4%
10%
Used entire length of I-81
Used some of I-81
0%
10%
20%
30%
40%
50%
60%
70%
80%
Percent of all traffic

Results


Directional Distribution (from the survey)
Direction
Through
Inbound
Outbound
Within
30%
28%
13%
18%
11%
Used entire length of I-81
Used some of I-81
0%
10%
20%
30%
40%
50%
60%
70%
80%
Percent of all traffic


Directional Distribution (from Transearch)
Direction
Through
Inbound
Outbound
Within
30%
33%
5%
14%
18%
Used entire length of I-81
Used some of I-81
0%
10%
20%
30%
40%
50%
60%
70%
80%
Percent of all traffic

Truck Flows and Diversion Targets

Initial Estimate

What's the "target"?

60% of long haul through trucks in the I-81 corridor

What's a truck?

3+ axle trucks, from VA 2005 counts

What's a long-haul through-truck?

% of I-81 routed trucks that enter and leave VA via I-81

Estimated at 58% of all I-81 trucks crossing state lines, from Transearch database

What's a through-truck that's feasible to divert?

Near term -- 65% of trucks with dry van commodities and equipment types

Long term – with new rail technology, up to 85% of trucks, mixed equipment and commodities

Truck Flows and Diversion Targets

Initial Estimate

What's the bi-directional bottom line?

Currently 9,600 trucks/day at the VA/TN border

Currently around 5,600 through trucks per day, growing to 11,900 in 2035

Aim to divert around 1,500 trucks per day in 2020 (30% of 65% of through trucks)

Aim to divert around 6,000 trucks per day in 2035 (60% of 85% of through trucks)

What's a through-truck that's feasible to divert?

- Near term -- 65% of trucks with dry van commodities and equipment types
- Long term – with new rail technology, up to 85% of trucks, mixed equipment and commodities

What's the bi-directional bottom line?

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- Currently around 5,600 through trucks per day, growing to 11,900 in 2035

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Revised Truck Flows and Diversion Targets

Slight drop in 2020 target, no change in 2035 target

I-81 Corridor Truck to Rail Diversion: Northbound Opportunity

Line	Metric	Source	2005 Base Case		Start-Up (2010)		Intermediate (2020)		Mature (2035)		Mature (2035) with RO-RO	
			Factor	Trucks/Day	Factor	Trucks/Day	Factor	Trucks/Day	Factor	Trucks/Day	Factor	Trucks/Day
(1)	Trucks at Troutville Count Station	VDOT (July 26-27, 2007)		7,779	110%	8,557	131%	10,190	195%	15,169	195%	15,169
(2)	Percent of Trucks Using I-81 for End-to-End Through State Moves	CS analysis of I-81 Truck Surveys	44%		44%		44%		44%		44%	
(3)	***Subtotal, All I-81 Through Trucks***	***Line (1)*(2)***		***3,423***		***3,765***		***4,484***		***6,674***		***6,674***
(4)	Share of Through Trucks That Could Potentially Be Diverted, Based on Commodity Type and Equipment Type	CS analysis of I-81 Truck Surveys (current), Global Insight (future)	-		62%		62%		62%		85%	
(5)	***Subtotal, Potentially Divertable I-81 Through Trucks***	***Line (3)*(4)***		***-***		***2,334***		***2,780***		***4,138***		***5,673***
(6)	***Diversion Targets***	***2035 Target from H 1581***	***-***	***-***	***30%***	***700***	***30%***	***834***	***60%***	***2,483***	***60%***	***3,404***

I-81 Corridor Truck to Rail Diversion: Southbound Opportunity

Line	Metric	Source	2005 Base Case		Start-Up (2010)		Intermediate (2020)		Mature (2035)		Mature (2035)	
			Factor	Trucks/Day	Factor	Trucks/Day	Factor	Trucks/Day	Factor	Trucks/Day	Factor	Trucks/Day
(1)	Trucks at Troutville Count Station	VDOT (July 26-27, 2007)		6,970	115%	8,016	144%	10,037	232%	16,170	232%	16,170
(2)	Percent of Trucks Using I-81 for End-to-End Through State Moves	CS analysis of I-81 Truck Surveys	32%		32%		32%		32%		32%	
(3)	***Subtotal, All I-81 Through Trucks***	***Line (1)*(2)***		***2,230***		***2,565***		***3,212***		***5,175***		***5,175***
(4)	Share of Through Trucks That Could Potentially Be Diverted, Based on Commodity Type and Equipment Type	CS analysis of I-81 Truck Surveys (current), Global Insight (future)	-		57%	69	57%		57%		85%	
(5)	***Subtotal, Potentially Divertable I-81 Through Trucks***	***Line (3)*(4)***		***-***		***1,462***		***1,831***		***2,949***		***4,398***
(6)	***Diversion Targets***	***2035 Target from H 1581***	***-***	***-***	***30%***	***439***	***30%***	***549***	***60%***	***1,770***	***60%***	***2,639***

I-81 Corridor Truck to Rail Diversion: Summary (Northbound plus Southbound)

Metric	2005 Base Case	Start-Up (2010)	Intermediate (2020)	Mature (2035)	Mature (2035)
	Trucks/Day	Trucks/Day	Trucks/Day	Trucks/Day	Trucks/Day
Sum of Diversion Targets, Both Directions	***-***	***1,139***	***1,383***	***4,253***	***6,043***

Effective diversion	***% of through trucks***	***18%***	***18%***	***36%***	***51%***
	% of all trucks	***7%***	***7%***	***14%***	***19%***

Implications for Market Analysis – Northbound

"First draft" analysis of Troutville survey responses

Top O-D State Pairs -- NB	
States	% of Responses
VA-VA	7%
TN-PA	5%
TX-PA	5%
TN-VA	4%
GA-PA	4%
NC-PA	4%
VA-PA	3%
NC-VA	3%
AL-PA	3%
VA-MD	2%
CA-NJ	2%
NC-NY	2%
GA-NY	2%
TN-NJ	2%
TX-NY	2%
GA-VA	2%
SC-VA	2%
NC-NJ	1%
AL-MD	1%
GA-MA	1%
Other	43%

Orgin-Destination Pairs -- NB		
Entry	Exit	Share of Reported
81	81	44.3%
77	81	12.6%
81	VA	10.5%
81	495/95/66	8.8%
VA	VA	7.0%
VA	81	6.7%
77	VA	4.1%
220	81	1.1%
VA	495/95/66	1.0%
220	VA	0.6%
85	VA	0.4%
77	495	0.4%
all other		2.5%

Other Data -- NB
99% of through trucks were combination
99% of through trucks were loaded
33% of through trucks were pre-pass

Through Commodities -- NB	
Grouping	Share of Reported
Mixed Freight/Unknown	49%
Food and beverage	19%
Household items	12%
Electronics and appliances	5%
Paper and products	5%
Building materials and machinery	4%
Empty	1%
Chemicals and plastics	3%
Clothing	1%
Fuel	1%
Vehicles and parts	1%
Minerals	0%
Grand Total	100%

Through Truck Types -- NB	
Type	Share of Reported
Container	33%
Dry Bulk/Dry Van	31%
Dry Van	18%
Other	17%
Auto	1%

Implications for Market Analysis – Southbound

"First draft" analysis of Troutville survey responses

Top O-D State Pairs -- SB	
States	% of Responses
VA-VA	11%
VA-NC	6%
PA-NC	5%
PA-TN	5%
PA-VA	4%
MD-VA	3%
PA-GA	3%
NJ-TN	3%
VA-TN	3%
PA-SC	2%
NJ-TX	2%
VA-GA	2%
PA-TX	2%
VA-FL	2%
NY-NC	2%
NJ-VA	2%
NJ-GA	2%
NJ-NC	2%
Other	41%

Orgin-Destination Pairs -- SB		
Entry	Exit	Share of Reported
81	81	32.4%
81	77	17.1%
VA	VA	11.5%
VA	81	10.0%
81	VA	8.3%
VA	77	5.9%
495	81	5.3%
495	VA	2.6%
81	220	1.9%
VA	220	1.4%
64	VA	0.6%
495	77	0.5%
340	81	0.3%
340	77	0.3%
15	77	0.3%
all other		1.6%

Through Commodities -- SB	
Grouping	Share of Reported
Food and beverage	24%
Mixed Freight/Unknown	24%
Household items	8%
Paper and products	8%
Chemicals and plastics	7%
Vehicles and parts	7%
Clothing and textiles	5%
Building materials and machinery	5%
Empty	3%
Metals	3%
Waste	2%
Agriculture non-food	2%
Minerals	1%
Electronics and appliances	1%
Fuel	0%
Grand Total	100%

Other Data -- SB

100% of through trucks were combination
97% of through trucks were loaded
36% of through trucks were pre-pass

Through Truck Types -- SB	
Type	Share of Reported
Container	1%
Dry Bulk/Dry Van	65%
Dry Van	16%
Other	15%
Auto	3%

Next Steps

- Finish cleaning and processing survey results
  - Finalize Troutville (still some odd routings)
  - Complete Stephens City
  - Compare/validate
- Finalize truck diversion targets
- Initiate benefit analysis with Virginia DRPT and HLB
  - Determine cost/reasonableness of “60% scenario”
  - Evaluate other scenarios as study advances
- Work with NS on their study inputs
  - Timing and availability?